DECLARATION OF MARVIN M. JOHNSON, Ph.D., NAE

I, Marvin M. Johnson, declare as follows:

1. I am a United States citizen and was born March 21, 1928.

2. I received a B.S. degree and a Ph.D. degree in Chemical Engineering from the University of Utah.

3. I have worked as a chemical engineer at Combined Metal Reduction Company, Salt Lake City, Utah and as a process engineer for Standard Oil of California (now Chevron). I have worked for Phillips Petroleum Company for over forty (40) years where I currently serve as a Research Fellow and formerly served as the leader of the Technical Advocacy Committee.

4. I have taught chemical engineering courses at the college and graduate level for three (3) years at Oklahoma State University and for one year at the University of Kansas and the Colorado School of Mines.

5. A copy of my resume is included as attachment A.

6. I have studied United States Patent No. 1,865,607 ("the Allen reference").

7. I also have an understanding of the technology taught and claimed in pending United States Patent Application Serial No.08/888,376 and in its corresponding PCT International Application No. PCT/US98/14085, and in United States Patent Application Serial No. 09/131,121 for sulphurous acid generators (collectively referred to as "the claimed acid generator").

8. I possess knowledge of a person of ordinary skill in the relevant art.

9. The claimed acid generator is directed to oxidation reaction. Unlike the claimed acid generator, the Allen reference teaches a different hydration reaction. This is significant because the structure and process of the oxidation reaction of the claimed acid generator is not taught by the Allen reference.

10. The claimed acid generator starts with raw sulphur. The sulphur is combusted to create SO_2 at ambient pressure. The SO_2 is then dissolved in ambient temperature water at ambient pressure and creates H_2SO_3 in the host water. This reaction occurs all along the path of the flow of water. The H_2SO_3 reacts with O_2 dissolved in the water at ambient temperature and pressure to form dilute H_2SO_4. This reaction also occurs all along the path of the flow of water. Unlike the claimed acid generator, the Allen reference begins with pressurized sulphuric anhydride (SO_3) in a gas phase from another source ("gases containing the sulphuric anhydride ... enter the apparatus through a pipe 10", Allen, pg. 1, lines 35-39, pg. 3, line 74). The sulphurous anhydride is reacted with "hot hydrogen oxide" or "steam." This reaction occurs under pressure. The sulphurous anhydride and steam are allowed to mix and react in a straight tube 17 "of sufficient length for the completion of the desired reaction." Allen reference, pg. 1, lines 63-65.

11. Unlike the claimed acid generator, after completion of the reaction in tube 17, the Allen references teaches the use of a "cooler or condenser 18." Allen, pg. 1, line 67. This produces a "purity known commercially as chemical purity" "without a distillation treatment." Allen, pg. 1 lines 3-4, 18-19. The pure sulphuric acid is gathered in the base of tower 19 where "a suitable draw-off device, for instance a [stop]cock 20" is located to release chemically pure sulphuric acid. A suction pipe 28 is employed to draw the gases through the system and to prevent the dangers of leaks of "hot strong sulphuric vapors." Allen, pg., lines 20-37.

12. The claimed acid generator is directed to a dilute sulphurous acid, comprising principally a host water. Unlike the claimed acid generator, the Allen reference process produces a concentrated sulphuric acid without water, that is, no need for distillation to remove unwanted water or other fluids.

13. As discussed above, the claimed acid generator is directed to a process in an open system, occurring under ambient temperature and pressure. Unlike the claimed acid generator, the Allen reference teaches a process under pressure and temperature.

14. The gaseous, hydration reaction of the Allen reference does not teach the oxidation reaction of the claimed acid generator. In other words, the Allen reaction is completed in tube 17 without any teaching or suggestion of the configuration of containment, blending and agitation zones, a mixing tank and a submersion pool of the claimed acid generator.

15. I declare under penalty of perjury that the foregoing is true and correct.

Date: 27 July 1999 Marvin M Johnson

Marvin M. Johnson, Ph.D., NAE